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Yehoram Gordon, Alexander Litvak, Alain Pajor and Nicole Tomczak-Jaegermann\* (nicole.tomczak@ualberta.ca), Dept of Mathematical and Statistical Sciences, Edmonton, Alberta T6G 2G1, Canada. Random  $\varepsilon$  nets and embeddings in  $\ell_{\infty}^{N}$ .

We show that, given an *n*-dimensional normed space X a sequence of  $N = (8/\varepsilon)^{2n}$  independent random vectors  $(X_i)_{i=1}^N$ , uniformly distributed in the unit ball of  $X^*$ , with high probability forms an  $\varepsilon$  net for this unit ball. Thus the random linear map  $\Gamma : \mathbb{R}^n \to \mathbb{R}^N$  defined by  $\Gamma x = (\langle x, X_i \rangle)_{i=1}^N$  embeds X in  $\ell_{\infty}^N$  with at most  $1 + \varepsilon$  norm distortion. In the case  $X = \ell_2^n$  we obtain a random  $1 + \varepsilon$  embedding into  $\ell_{\infty}^N$  with asymptotically best possible relation between N, n, and  $\varepsilon$ . (Received August 11, 2008)